

Southern Exposure 2015- Objectives
Advisory Team for the Environment, Food and Health
October 21, 2014

1. Exercise activation of the Advisory Team and noted in the *Federal Interagency Improvised Nuclear Device Concept of Operations Plan (Version 10)*, November 17, 2009 [CONPLAN]
2. Incorporate the Advisory Team PSMA, CON OPS
 - a. Establish the Remote Advisory Team within 24 hours of notification.
 - b. Determine members who will deploy and establish the on-site Advisory Team.
3. Determine Advisory Team participation across various sites in DC - NRCC, FDA HQ, NRC HQ, White House, etc. and identify/deploy individuals for each site.
4. Explore/exercise potential staff rotations for various time jumps within the exercise.
5. Integrate with State, Local and Federal Partners:
 - a. Deploy on site members to the UCG and FRMAC Planning Section site and establish an on-site Advisory Team within established timelines.
 - b. Coordinate operations with State Emergency Operations Center and FEMA IMAT assets.
 - c. Establish points of contact with other Federal Agencies – DHHS, DOT, DOS, FBI, NOAA, etc.
 - d. Integrate with State assets and make effective use of the Consequence Management Home Team (CMHT) during the exercise. This will include briefing and dissemination of information obtained from the CMHT to Advisory Team members as they travel and arrive onsite and to Advisory Team members who participate remotely.
 - e. Identify and integrate with appropriate ESF Leads
6. As requested, develop and provide coordinated advice and recommendations on environmental, food, health, and animal health matters for the Incident Command/Unified Command (IC/UC), DHS, the Joint Federal Office (JFO) Unified Coordination Group, the coordinating agency, and/or State, tribal, and local governments, as appropriate.

7. Exercise and evaluate the availability and utilization of information provided by the IMAAC, FRMAC, and other relevant sources.
 - a. Exercise providing Federal advice in matters related to the following:
 - i. Environmental assessments (field monitoring) required for developing recommendations with inputs from State, tribal, and local governments and/or the FRMAC.
 - ii. Protective Action Guides (PAGs) and their application to the emergency.
 - iii. Protective Action Recommendations (PARs) using data and assessment from the FRMAC.
 - iv. Protective actions to prevent or minimize contamination of milk, food, and water, and to prevent or minimize exposure through ingestion.
 - v. Recommendations for minimizing losses of agricultural resources from radiation effects.
 - vi. Availability of food, animal feed, and water supply inspection programs to ensure wholesomeness.
 - vii. Relocation, reentry, and other radiation protection measures prior to recovery.
 - viii. Recommendations for recovery, return, and cleanup issues.
 - ix. Health and safety advice or information for the public and for workers.
 - x. Estimated effects of radioactive releases on human health and the environment.
 - xi. Other matters, as requested by the IC or coordinating agency.
8. Effectively follow the draft Advisory Team SOP's and utilize established ICS forms for recording logging activities, documenting communication with external partners, etc.
 - a. Evaluate data flow among the field monitoring teams, FRMAC, Advisory Team and the coordinating agency. Assure we stay within our mission, e.g. only accept questions that apply to our capabilities and mission.)
9. Evaluate Advisory Team response capabilities including communication among Advisory Team members and between Advisory Team members, their respective agency, HQ, and the coordinating agency. This includes communications with the remote Advisory Team during

initial deployment. (Example: Define the information, e.g. is it an Advisory Team request or specific to an individual agency and their representative? Evaluate information flow coming and going.)

10. Determine the Advisory Team's role in support for recovery operations and decision making, including the need for additional SME's and/or agency officials.
11. Examine the resource needs for long term recovery support (number, specialties, time commitments of A-Team members, etc.).

DRAFT

CONCEPT OF OPERATIONS

SUBCOMMITTEE ON ENVIRONMENT, FOOD AND HEALTH

and the

ADVISORY TEAM FOR ENVIRONMENT, FOOD AND HEALTH

1.0 INTRODUCTION

1.1 Purpose

This Concept of Operations document describes how the Subcommittee on Environment, Food and Health (the Subcommittee) and its operational team, the Advisory Team for Environment, Food and Health (the Advisory Team) will conduct business. It describes how the member agencies of the Subcommittee will coordinate preparedness and response for a radiological emergency with each other and with other emergency organizations. It also specifies the duties and responsibilities of the Advisory Team when activated.

1.2 Authority

This document implements activities authorized by federal regulations and executive orders including:

- Executive Order 12656
- Public Law 96-295
- Executive Order 12241
- Title 44 Code of Federal Regulations Part 351 (44 CFR 351)
- National Response Framework (NRF), March 2008
- National Response Framework (NRF) Nuclear/Radiological Incident Annex, June 2008.

1.3 Approvals

This document and all revisions shall be distributed for signature to the agencies identified on the following Approvals page. Upon receiving all of the designated signatures, the Subcommittee Chairperson will sign and authorize the document for official use and provide copies to the signatory agencies.

Approvals

The following have agreed to fully meet the requirements set forth in this Concept of Operations plan including training and equipping of personnel and compliance with procedures:

James Kish
Co-Chair
Federal Radiological Preparedness Coordinating Committee

Date

Andrew Mitchell
Co-Chair
Federal Radiological Preparedness Coordinating Committee

Date

Todd Repass,
Director
Office of Homeland Security and Emergency Coordination
United States Department of Agriculture

Date

Daniel M. Sosin
Acting Director
Office of Public Health Preparedness and Response
Centers for Disease Control and Prevention

Date

Michael P. Flynn
Director
Office of Radiation and Indoor Air
United States Environmental Protection Agency

Date

Kristine Leiphart
Deputy Chief Operating Officer
Office of Crisis Management
United States Food and Drug Administration

Date

CAPT Michael A. Noska
Chair
Subcommittee on Environment, Food and Health

Date

2.0 ABOUT THE SUBCOMMITTEE AND THE ADVISORY TEAM

2.1 Background

The Federal Radiological Preparedness Coordinating Committee (FRPCC) was established by 44 CFR 351 in 1982. This regulation charged the FRPCC member agencies with assisting state and local governments in emergency planning and preparedness activities. The Subcommittee on Environment, Food and Health (the Subcommittee) was established by the FRPCC in 1997 based on section 351.11 of 44 CFR 351. The purpose of the Subcommittee is to aid the FRPCC in carrying out its regulatory functions. Specifically, the role of the Subcommittee is to provide guidance for the Advisory Team for Environment, Food and Health (the Advisory Team). The Advisory Team is an emergency response group tasked with providing protective action recommendations to state and local governments on behalf of its member agencies. The Advisory Team is incorporated into the Nuclear/Radiological Incident Annex (June 2008) of the National Response Framework (NRF) and is comprised of subject matter experts from represented agencies who have been activated to respond as members of the Advisory Team during a radiological incident.

The Subcommittee is led by a Chair who is appointed by the FRPCC Chairs from among the Subcommittee member agencies. When activated, the Advisory Team will assign a Chair according to its procedures.

2.2 Mission

The Advisory Team is identified in the Nuclear/Radiological Incident Annex of the National Response Framework as one of the specialized federal assets which can be requested by the Department of Homeland Security (DHS) and the coordinating agencies in response to a nuclear/radiological incident. The coordinating agencies are defined in the Nuclear/Radiological Incident Annex as those federal agencies that own, have custody of, authorize, regulate or are otherwise assigned responsibility for the nuclear/radioactive material, facility or activity involved in an incident.

The mission of the Advisory Team is to develop coordinated advice and recommendations on environmental, food, public health and animal health issues during radiological incidents.

The advice and recommendations of the Advisory Team are developed for use by

- the Coordinating Agency,
- the Department of Homeland Security,
- State, tribal, and local governments,
- Incident Command/Unified Command, and
- the Joint Field Office in the Unified Coordination Group.

The Advisory Team can also serve as a liaison between state, tribal, and local governments and the Advisory Team members' home departments and agencies.

2.3 Scope

The scope of Subcommittee and Advisory Team activities potentially includes all types of radiological or nuclear emergencies that may occur within the United States and its territories.

2.4 Members

Permanent membership of the Subcommittee includes the U.S. Department of Agriculture (USDA), the Centers for Disease Control and Prevention (CDC), the U.S. Environmental Protection Agency (EPA), and the Food and Drug Administration (FDA). The agencies identify and provide assigned representatives. The permanent members may invite other agencies to participate in Subcommittee or Advisory Team activities.

2.5 Subcommittee/Advisory Team Responsibilities

The Subcommittee assists State, tribal and local governments in preparing for radiation emergencies by conducting informational training (outreach) and by participating in emergency response exercises.

When activated, the Advisory Team will provide Federal recommendations in matters related to the following:

- Environmental assessments (field monitoring) required for developing recommendations with advice from State, tribal and local governments and/or the Federal Radiological Monitoring and Assessment Center (FRMAC);
- Protective Action Guides (PAGs) and their application to the emergency;
- Protective Action Recommendations (PARs) using data and assessment from the FRMAC;
- Protective actions to prevent or minimize contamination of milk, food, and water and to prevent or minimize exposure through ingestion;
- Recommendations for minimizing losses of agricultural resources from radiation effects;
- Availability of food, animal feed and water supply inspection programs to assure wholesomeness;
- Relocation, reentry and other radiation protection measures prior to recovery;
- Recommendations for recovery, return and cleanup issues;
- Health and safety advice or information for the public and for workers;
- Estimated effects of radioactive releases on human health and the environment;
- Other matters as requested by the Incident Command or coordinating agency.

2.6 Member Agency Responsibilities

In addition to the responsibilities assigned to individual agencies for response to a radiological emergency, each Subcommittee member agency will provide the following support to the Subcommittee and the Advisory Team:

- Adequate funding, qualified and trained staff, equipment and data necessary to
 - respond to radiation emergencies,
 - participate in emergency drills and exercises,
 - participate in outreach training activities provided to State, tribal, local governments and federal agencies;
 - participate in Subcommittee meetings and planning activities;
- At all times have at least one Subcommittee member immediately available via cellular telephone or pager.
- Ensure that qualified and trained personnel are prepared for timely deployment if the Advisory Team is activated. The minimum equipment and software required for deployment shall be determined by the Subcommittee.

2.7 Preparedness Responsibilities of the Subcommittee Chairperson and Advisory Team Member Expectations.

The Subcommittee Chairperson, or a designee, is responsible for:

- Ensuring that Subcommittee member agencies have provided adequate personnel to participate on the Advisory Team if it is activated during an actual radiological emergency.
- Maintaining a schedule of known exercises, conferences and meetings and arrange for the proper level of Subcommittee/Advisory Team support for each of these. This includes arranging a communication bridge when needed.
- Conducting a meeting of the Subcommittee at least once per year.
- Reporting all Subcommittee and Advisory Team activities to the FRPCC.

Advisory Team Member Expectations:

- Members are expected to participate on the Advisory Team if it is activated during an actual radiological emergency.
- Members are expected to participate in planning, preparedness and training exercises as part of the Advisory Team.
- Members are expected to maintain applicable training qualifications.

2.8 Subcommittee Working Groups

The Subcommittee Chairperson will appoint Working Groups as needed to help accomplish the goals of the Subcommittee. Each Working Group will include at least one representative from each member agency. Subcommittee Working Groups can include, but are not limited to, the following:

2.8.1 Concept of Operations Working Group

The Concept of Operations Working Group is responsible for creating and updating the Charter, the Concept of Operations and the Advisory Team Procedures Manual.

2.8.1.1 The Charter is a summary of the mission statement, membership, and authority of the Subcommittee. It must be approved by each member agency.

2.8.1.2 The Concept of Operations discusses the approach and expectations of the Subcommittee and the Advisory Team including member agency support requirements, activation, mobilization and training requirements. The Concept of Operations must be approved by each member agency.

2.8.1.3 The Advisory Team Procedures Manual will contain operating procedures, such as methods for obtaining meteorological data, for use by the Subcommittee and the Advisory Team. The Advisory Team Procedures Manual will be a living document and can be revised as needed by the Concept of Operations Working Group and approved by the Subcommittee Chairperson.

2.8.2 Outreach Working Group

The Outreach Working Group will prepare presentations, fact sheets, and other instructional materials explaining the mission, membership, and capabilities of the Subcommittee and the Advisory Team. These materials will be used by Subcommittee and Advisory Team members during presentations to Federal, State, tribal and local agencies.

2.8.3 Training Working Group

The Training Working Group is responsible for recommending the basic training for members of the Subcommittee and the Advisory Team. This Working Group will prepare presentations, fact sheets, check off lists, and other training products for agency members. This includes “just in time” training aids for individuals who have not participated in Subcommittee or Advisory Team activities in the past but who have been called on in a time of emergency to represent their agencies on the Advisory Team. The basic training recommendations and training products will be reviewed and updated annually as needed.

2.8.4 Logistics Working Group

The Logistics Working Group will develop recommendations on the required equipment needed for team members, including those deployed to the field. Equipment requirements will be assessed annually by the Working Group to ensure that equipment requirements for team members are state of the art and not obsolete.

3.0 SUBCOMMITTEE AND ADVISORY TEAM MEMBERSHIP REQUIREMENTS

3.1 Training

Each Subcommittee member agency will ensure that staff who could be activated with the Advisory Team are sufficiently knowledgeable to work effectively with other member agencies on typical problems and are familiar with commonly used references, software and equipment.

3.2 General

Each Subcommittee member and potential Advisory Team member shall have knowledge and training as delineated by the Training Working Group. This will include a thorough understanding of the EPA and FDA protective action guides (PAGs) and derived intervention levels (DILs), and their use. It will also include an understanding of information provided by the Interagency Modeling and Atmospheric Assessment Center (IMAAC), the Federal Radiological Monitoring and Assessment Center (FRMAC) and other relevant sources.

3.3 Participation in Exercises

Subcommittee and Advisory Team members are expected to participate in at least one exercise per year. Participation may consist of drills, table-tops, or full field exercises.

3.4 Reach-back

Advisory Team members should be able to assist other federal government agencies or state and local governments by contacting needed expertise available elsewhere in their respective agencies.

3.5 Equipment

The list of recommended equipment for Subcommittee and Advisory Team members will be developed by the Logistics Working Group and updated annually. Subcommittee member agencies should provide the recommended equipment to their staff serving on the Subcommittee and to staff who could be deployed as part of an activated Advisory Team.

4.0 ADVISORY TEAM ACTIVATION PROCEDURES

Nothing in this document should be construed to mean that Subcommittee members cannot contact one another at any time on any technical matters within their areas of expertise. Subcommittee members are encouraged to solicit the advice of their colleagues in member agencies. However, no member of the Subcommittee will contact a state or local government official or a coordinating agency official as a representative of the Advisory Team unless the Advisory Team has been activated as described below.

4.1 Activation/Notification

In accordance with the Nuclear/Radiological Incident Annex, activation of the Advisory Team begins when one of the following happens:

- The Department of Homeland Security (DHS), a coordinating agency, or a State, tribal or local government contacts the CDC Emergency Operations Center (EOC) by calling 770-488-7100 and requests support from the Advisory Team.
- DOE will request activation of the Advisory Team whenever the FRMAC is activated.

After receiving a request for Advisory Team support, the CDC will then contact each Subcommittee member agency (according to directions provided to CDC by each member agency) and declare that a request for Advisory Team support has been made. Each member agency will then follow their own internal procedure for notifying/activating their designated Advisory Team members.

The Advisory Team will be considered fully activated when the following conditions are met:

- All Subcommittee member agencies have identified the appropriate person(s) to serve on the Advisory Team and
- All Subcommittee member agencies have reported to the Subcommittee Chairperson with names and contact information for their activated Advisory Team member(s).

The Subcommittee Chairperson (or designee) will establish contact with the activated Advisory Team by phone bridge as soon as possible. The goal is to have a remote Advisory Team activated within 2 hours of the initial notification to the CDC EOC. Each team member will maintain contact with his/her parent agency and keep it aware of Advisory Team activities.

Consistent with Incident Command System (ICS) protocols, the most highly qualified Advisory Team member serving in a specific exercise or response will serve as the Advisory Team Chairperson. This responsibility may be transferred and noted in a written log as other Advisory Team members are activated who may have more

experience or be better qualified to act as Advisory Team Chairperson. The Advisory Team Chairperson will preferably be someone who has played as a member of the Advisory Team in at least two exercises. The Advisory Team Chairperson will establish contact with the coordinating agency and other Advisory Team members as appropriate.

4.2 Deployment of Activated Advisory Team

If requested by a state or local government, and with concurrence of the coordinating agency, the Advisory Team member agencies will follow their own agency procedures for dispatching team members to the location(s) designated by the coordinating agency. Once established at the site, the on-site Advisory Team members will assume control of Advisory Team activities. The Advisory Team Chairperson should then be chosen from one of the on-site members. The on-site Advisory Team will rely on the remote Advisory Team (members who were not deployed) and their parent agencies for support. The on-site and remote Advisory Team members should provide telephone numbers to their agency Emergency Operations Centers and to other key people in their parent agencies.

The Advisory Team Chairperson shall contact the Documentation Unit Leader to ensure that appropriate records of Advisory Team activities are retained, including a narrative of major events, questions to the Advisory Team, protective actions recommended, protective actions taken, and an updated schedule of meetings, activities, and appointments for the Advisory Team members. If necessary, the Advisory Team Chairperson may designate a representative to serve as a liaison to the Documentation Unit or to document Advisory Team activities for the Documentation Unit.

The Advisory Team Chairperson will coordinate with on-site team members and designate someone to establish and maintain a phone bridge between deployed Advisory Team members, their parent agencies and others as needed. This phone bridge may be a continuation of the one established by the Subcommittee Chairperson during the initial notification/activation phase of the incident.

It is recommended that each member agency appoint an individual in their Emergency Operations Center (EOC) to monitor the Advisory Team phone bridge when it is operational. This is the only way to ensure reliable communications between the Advisory Team members (remote and on-site) and their parent agencies. If an agency's EOC chooses not to monitor the Advisory Team phone bridge, then Advisory Team members shall provide their parent agency EOC with current contact information for the Advisory Team, the coordinating agency and liaisons. Advisory Team members shall exchange telephone numbers and arrange for a backup communication mode if the phone bridge is lost.

4.2.1 Deployment Locations

Advisory Team members will report to locations as instructed by the coordinating agency. If instructions are not given by the coordinating agency, then the Advisory Team Chairperson will obtain direction from the Incident Command

post and report to the Senior Federal Official, the Planning/Operations cell, or the FRMAC Director as appropriate.

4.2.2 Deployment to the Scene

The Advisory Team is expected to incorporate into the Incident Command (IC)/Unified Command (UC) in the Planning Section to provide technical expertise to the IC/UC and the coordinating agency. The Advisory Team may also provide liaisons to and/or coordinate with the Joint Field Office and State, tribal and local government Emergency Operation Centers as needed. Therefore, the Advisory Team members may be in several locations at any one time, including being co-located with the FRMAC. When assigned to multiple locations, the Advisory Team will rely upon phone bridges and internet connection to communicate with other Advisory Team members and their parent agencies.

4.3 Facilities

When deployed, the Advisory Team will request the following facilities from the host agency:

- Work space (for 6 or more)
- Telephone lines (at least 2)
- Electrical outlets (at least 4)
- At least one computer terminal with high speed Internet access

Internet access may require a secure connection and should be evaluated on a case by case basis by the Advisory Team Chairperson.

Many Emergency Operations Centers will not allow outsiders to load software onto their computers or connect outside computers into their networks. The Advisory Team should plan to perform computations on an isolated laptop and to use a computer provided by the facility for electronic mail and internet searches.

5.0 DEPLOYMENT PROCEDURES AND OPERATIONS

5.1 Logistics Coordinator

When the Advisory Team has been activated and requested to deploy, the Subcommittee Chairperson will designate a Logistics Coordinator. The Logistics Coordinator will not be one of the deploying Advisory Team members. The Logistics Coordinator will perform the following functions:

- Remain available by telephone and electronic mail to assist deploying Advisory Team members.
- Begin carrying out the team check off list from the Advisory Team Procedures Manual. The check off list is a list available to the Logistics Coordinator detailing

items members of the team should have when they deploy, contact information for member agencies, as well as travel plans for deployed members.

- Contact the coordinating agency and act as Advisory Team liaison until the deployed Advisory Team is functional.

5.2 Advisory Team Chairperson

The first Advisory Team member to arrive will become the Acting Advisory Team Chairperson. The Acting Advisory Team Chairperson will obtain the check off list via e-mail, fax, or phone communication from the Logistics Coordinator and continue to complete it. An Advisory Team Chairperson will be selected once the full Advisory Team is functioning at the scene. As the incident progresses the Advisory Team may select a different Chairperson based upon the expertise needed on the scene.

The Advisory Team Chairperson is responsible for the following:

- Coordinating internal Advisory Team communications, such as meetings and teleconferences;
- Coordinating and maintaining contact with the Logistics Coordinator appointed by the Subcommittee Chairperson;
- Working with the Liaison from the coordinating agency to provide appropriate interface between the Advisory Team, the coordinating agency, and state and local government representatives;
- Contacting the Documentation Unit Leader to ensure appropriate records of Advisory Team activities are retained and appointing a liaison to the Documentation Unit if needed;
- Providing situational awareness in-briefings for incoming Advisory Team members;
- Ensuring that Advisory Team members participate in meetings, conferences and other activities as needed or requested;
- Ensuring that Advisory Team members keep their parent agencies informed of Advisory Team activities.

5.3 Advisory Team Member Agencies

Advisory Team member agencies function as technical advisors to the coordinating agency, to state, tribal, and local governments, and to other federal agencies. In addition, member agencies may have regulatory responsibilities to implement and to coordinate among government agencies and jurisdictions.

Member agencies will:

- Provide at least one trained and equipped representative for deployment to the scene as needed to maintain support for each incident shift as directed by the supporting Incident Command Structure. Advisory Team member support will also include those individuals who support the incident remotely, such as the Logistics Coordinator, at each deployment of the Advisory Team, sufficient to cover a

minimum of two deployments. Representatives may be available by telephone or present at the scene.

- Make additional technical expertise available to the Advisory Team from the agency's headquarters and other facilities.

5.4 Coordinating Agency Responsibilities

The coordinating agency will perform the following according to the functional incident command system structure in place for the event:

- Begin Advisory Team activation by contacting the CDC EOC and requesting support from the Advisory Team;
- Notify the Subcommittee Chairperson (who should notify the Logistics Coordinator);
- Provide in-briefing to arriving Advisory Team members;
- Designate a liaison between the coordinating agency and the Advisory Team;
- Designate a liaison between the Advisory Team and State, tribal and local government representatives;
- Ensure that State, tribal, and local officials have timely access to the Advisory Team for advice and recommendations;
- Maintain communications with the Logistics Coordinator to ensure that the Advisory Team has suitable facilities. Depending on the situation, this may mean requesting space from a state or local government, providing a telephone bridge, or providing space in the coordinating agency's own facilities;
- Inform the Advisory Team when deactivation is appropriate.

5.5 FRMAC

DOE will request activation of the Advisory Team whenever the FRMAC is activated.

When established, the FRMAC will make the following information available to the Advisory Team:

- Provide situational awareness briefing;
- Instructions for obtaining electronic maps (PDF and SHAPE files) and other information as it becomes available;
- Schedule of flyovers and field team deployments;
- FRMAC contact information, including Senior Energy Official, FRMAC Director, and Program Manager;
- All known field data including sample analyses, dose rate measurements and locations of samples.

If the Advisory Team is collocated with the FRMAC, FRMAC will make the following available to the Advisory Team if not already supplied by the coordinating agency:

- Printer;
- Fax;

- Facilities described in paragraph 4.3;
- High speed internet connections, including member access to the CMweb.

5.6 Operations

- 5.6.1 The Advisory Team Chairperson shall ensure that all information required to formulate protective action recommendations is accessible to the entire team as soon as the information becomes available. The entire Advisory Team should be aware of requests for advice or assistance. Each team member is responsible for keeping his or her parent agency informed of requests made and advice given.
- 5.6.2 Participation in making recommendations by all Advisory Team member agencies is desired. A collegial approach generally should be sufficient to arrive at a consensus on issues that involve multiple agencies. The goal is to provide technically sound advice in a timely and appropriate manner. The Chairperson may raise to leadership, or a specific regulatory agency, any instance of conflicting advice or regulatory requirement.
- 5.6.3 The Advisory Team Chairperson will receive all requests from the coordinating agency and from State, tribal, or local governments for technical assistance from the Advisory Team. Requests for Advisory Team assistance shall be recorded by the designated personnel. See section 4.2 for more information.
- 5.6.4 The Advisory Team will refer all requests of media interviews to the Joint Information Center. If there is no Joint Information Center, the Advisory Team will refer media requests to the coordinating agency. Members will inform their parent agency's communications staff according to agency policy. Members of the Advisory Team in the field will not normally hold media interviews.
- 5.6.5 To ensure that all federal entities speak with one voice, Advisory Team agencies will not function independently from FRMAC regarding data products.

To: Foster, Kay[Kay.Foster@illinois.gov]; Koerner, John (HHS/ASPR/OEM)[John.Koerner@hhs.gov]; Alan.Remick@nnsa.doe.gov[Alan.Remick@nnsa.doe.gov]
Cc: 'Lodwick.Jeffrey@dol.gov'[Lodwick.Jeffrey@dol.gov]; Anderson, Jeri L. (CDC/NIOSH/DSHEFS)[jva2@cdc.gov]
From: DeCair, Sara
Sent: Tue 5/5/2015 5:34:01 PM
Subject: VR15: Worker guides from A Team
VR 15 ER WORKER RECOMMENDATION.docx

Sounds like you are talking worker guides, and I was moving on to public PAG alternative levels! I'm attaching what we used for last year's VR exercise for worker guidelines. Your summary is sleeker, though!

I cleaned this up with this year's header/footer if you want to hand it over. This is a drill!

S.

From: Foster, Kay [mailto:Kay.Foster@illinois.gov]
Sent: Tuesday, May 05, 2015 1:25 PM
To: DeCair, Sara; Koerner, John (HHS/ASPR/OEM); Alan.Remick@nnsa.doe.gov
Subject: RE: VR 15: Who should be on alt PAG distro?

Based on this, then I think we will go with 50 R for critical, life saving missions and 25 R over 4 days for all other activities (using units of R because we are only measuring exposure with meters and/or dosimeters and not calculating actual dose)

This would equate to no more than 5 R in a shift or 250 mR/hr.

Does this sound like I've interpreted what you said correctly?

From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Tuesday, May 05, 2015 11:58 AM
To: Koerner, John (HHS/ASPR/OEM); Alan.Remick@nnsa.doe.gov; Foster, Kay

Subject: VR 15: Who should be on alt PAG distro?

I think limiting the size of the distro for an alternative PAG discussion may be smart. I don't think I have Brad Potter's email address.

Actually, since I am the PAGs lead and I have this FRMAC Assessment WG paper on alternative PAGs (attached) let's speed things up and suggest 50 rad areas as first priority and then 25 rad areas (projected over four days). This would be consistent with last year's VR 14 recommendations and FRMAC Home Team can gin up products based on that.

Thoughts? Additional people I should include? Thanks! ((this is a drill))

Sara D. DeCair

<http://www.epa.gov/radiation/rert/pags.html>

202-343-9108

Room 1416 B in WJC West

To: Noska, Michael A[Michael.Noska@fda.hhs.gov]; Sincek, Jeffrey[Jeffrey.Sincek@fda.hhs.gov]
Cc: Povetko, Oleg[Povetko.Oleg@epa.gov]
From: DeCair, Sara
Sent: Tue 5/5/2015 5:01:54 PM
Subject: FW: VR 15: Who should be on alt PAG distro?
Alternate PAGs may be appropriate for IND incident-AWG 2010.docx

Just FYI, I'm trying a smaller discussion for this one, at first at least.

S.

((this is a drill))

From: DeCair, Sara
Sent: Tuesday, May 05, 2015 12:58 PM
To: Koerner, John (HHS/ASPR/OEM); Alan.Remick@nnsa.doe.gov; 'Foster, Kay'
Subject: VR 15: Who should be on alt PAG distro?

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Thoughts? Additional people I should include? Thanks! ((this is a drill))

Sara D. DeCair

<http://www.epa.gov/radiation/rert/pags.html>

202-343-9108

Room 1416 B in WJC West

1.0 Introduction

During the December 1-2, 2009 Federal Radiological Monitoring and Assessment Center (FRMAC) Assessment Working Group (AWG) meeting, AWG members discussed their concern that the current protective action guide (PAG) (e.g., evacuation, sheltering, relocation) recommendations promulgated by the EPA and DHS may not be appropriate for the high doses and large impacted area associated with Improvised Nuclear Device (IND) incident. The purpose of this paper is to review the current Federal guidance, summarize the AWG's concerns and to provide a preliminary notion of PAGs that may be suitable to an IND incident. A more detailed review of the existing public protection recommendations for nuclear incidents is provided in the Appendix A.

The current PAGs recommended for radiological releases are those promulgated by the Environmental Protection Agency (EPA) in the *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents* (PAG Manual) (EPA, 1992). The EPA PAGs were originally developed for radiological material releases such as off-normal nuclear power plant (NPP) incidents. NPPs are generally not sited in high-density urban areas and releases from off-normal NPP conditions are not likely to result in high or acute radiation doses to the surrounding population. Consequently the radiation dose levels, at which protective actions are recommended, are based upon stochastic (chronic) health effects from radiation exposures.

Federal guidance for IND incidents was promulgated in 2008, *The Planning Guidance for Protection and Recovery Following Radiological Dispersal Device (RDD) and Improvised Nuclear Device (IND) Incidents*, (i.e., DHS Planning Guidance), (Federal Register, Vol. 73, No. 149, Friday, August 1, 2008), and in 2009, *Planning Guidance for Response to a Nuclear Detonation* (DHS, January 16, 2009). This guidance affirmed (See Sections A.4 and A.5) the applicability of the PAG Manual PAGs for IND and Radiological Dispersal Device (RDD) incidents.

An IND in a densely populated urban area poses public protection challenges that require protective actions to focus on life saving, rather than on controlling excess cancer risk, and the existing PAGs do not do this. The AWG believes it would be prudent for the Federal government to establish alternate protective action recommendations for an IND incident that would recommend protective actions (e.g., sheltering/evacuation) for the public at radiation dose levels targeted towards life saving actions.

NOTE: It may be prudent to give these alternate PAGs a different name (e.g., IND PAGs, IND Protection Guides) to ensure they are not confused with the current EPA and DHS PAGs.

2.0 Discussion and Summary of Current PAGs

The current PAGs for public protection are based upon relatively low radiation exposures and are more appropriate for chronic, low-level radiation exposures. There is a need for alternate PAGs based on higher dose limits that are more appropriate for the high radiation, acute doses resulting from an IND incident, but that still have an acceptable risk of morbidity.

If an IND incident were to occur in a highly populated urban area in the United States it may be very difficult or impossible to implement public protective actions at the current PAG dose levels because of the large population that would have to be managed (e.g., evacuation, sheltering). If an IND incident occurred in a large urban area and local decision makers decided to evacuate the population projected to receive a dose great than 1 rad (Note: this paper assumes 1 rad \approx 1 rem for an IND incident), then it is possible that hundreds of thousands of people would have to be evacuated and this could overwhelm the undamaged and damaged infrastructure (e.g., roads, bridges) and the emergency response

resources (e.g., personnel and vehicles). Furthermore those closest to ground zero that most urgently need to be evacuated, would not be able to evacuate because the evacuation routes have become gridlocked by the simultaneous evacuation of lower risk populations. Evacuation could be further complicated by geographical impediments (e.g., coasts, lakes, mountains) that limit the potential evacuation routes. Of course, the enormous difficulties associated with evacuating the population could be tempered by sheltering-in-place much of the affected population. However, as the current PAGs are written, sheltering-in-place and evacuation are not clearly separated as possible protective actions (i.e., they are both recommended at the same dose levels). Therefore, it is possible that many local Decision Makers would call for the evacuation of the affected population rather than implementing the shelter-in-place protective action because of the (mis)conception that evacuation would be more protective than sheltering-in-place.

3.0 Preliminary Recommendations for IND Protective Actions

A moderate increase in the Early Phase PAG dose limits could dramatically decrease the number of people that may need to be evacuated and lessen the burden and risk of attempting to evacuate very large populations. Although the *Planning Guidance for Response to a Nuclear Detonation* guidance (January 2009, see Section A.5) states that it provides guidance for an area within 3 miles from ground zero, it appears that the guidance does not adequately address public protection measures for the populations that are projected to receive doses greater than 5 rad, but less than those resulting in acute radiation effects.

The goal of the existing IND incident guidance is to limit acute radiation injuries which begin to be seen at a total effective dose of approximately 100 rad from acute exposures, as indicated by Table 1.4 from the January 2009 guidance (See section A.5).

Information on the correlation of lifetime cancer risk (not acute radiation injuries) with dose is provided on page 65 of the January 2009 guidance (See Section A.5). The guidance states that that an annual limit for a radiation worker of 5 rad increases the lifetime risk of cancer by <0.5% , a 25 rad dose would increase this risk by 2% and a 100 rad dose would increase this risk by approximately 6-8%. Thus, a lifetime cancer risk of 0.8% for a 10 rad dose and 4% for a 50 rad dose can be interpolated from this data.

A dose of 100 rad is generally accepted as the threshold dose where acute health effects begin to be seen in the exposed population. Therefore, it seems that an Early Phase PAG of approximately 25 – 50 rad for an IND incident is a reasonable compromise that would still provide an acceptable bound on the lifetime cancer risk to the affected population, but would also dramatically reduce the number of people that would be evacuated. Perhaps the population that is projected to receive a dose less than 25 or 50 rad should shelter-in-place until protective actions are completed for the population that has received higher, but non-lethal, doses.

Another potential shortfall of the current Federal guidance for an IND incident is that it is silent on the phased/prioritized implementation of protective actions. For example, if the plume-contour models project that 100,000 people would receive a dose great than 5 rad, then a fraction of this population will receive much higher doses. It would be prudent to prioritize the evacuation so that the population that is projected to receive higher doses (but less than acute death dose) is evacuated first and then lesser impacted populations should be evacuated. The phased evacuations would reduce the strain on emergency response resources and the supporting infrastructure. It would be helpful if Federal guidance

could be developed to help local decision makers understand the value of phased implementation of protective actions.

Table 1 presents a preliminary attempt to identify alternate protective action guides for an IND event. The attempt is to address the high-level (acute) doses and low-level doses, and to provide guidance for a phased (prioritized) response.

4.0 Conclusion

This paper reviews the existing Federal public protective guidance for an IND incident, concludes that current PAGs may not provide appropriate recommendations for the acute (high) dose impacts from an IND incident, requests that alternate Federal protective action guidance be considered for an IND incident and provides a preliminary opinion on alternate protective action guides.

The FRMAC AWG hopes that this paper will be considered during the review and updating of the *Planning Guidance for Response to a Nuclear Detonation* (January 16, 2009).

Table 1: Preliminary Suggestion of IND Protection Guides

Phase	Protective Action	Projected Dose	Comments
Early	Sheltering	>400 rem ^a	Shelter-in-place and take protective actions ^b until additional instructions are provided. Self-evacuate after 24 hr if supplies or medical attention is required
Early	Sheltering, then Evacuation	300 – 400 rem ^a	Shelter-in-place and take protective actions ^b for 24 hr or until additional instructions are provided. Self-evacuate if additional instructions are not received after 24 hr. Emergency response personnel should place <u>first</u> priority on assisting (e.g., evacuate) this population.
Early	Sheltering, then Evacuation	100 – 300 rem ^a	Shelter-in-place and take protective actions ^b for 24 hr or until additional instructions are provided. Self-evacuate if additional instructions are not received after 24 hr. Emergency response personnel should place <u>second</u> priority on assisting (e.g., evacuate) this population.
Early	Sheltering, then Evacuation	25 – 100 rem ^a	Shelter-in-place and take protective actions ^b for 24 hr or until additional instructions are provided. Self-evacuate if additional instructions are not received after 24 hr. Emergency response personnel should place <u>third</u> priority on assisting (e.g., evacuate) this population.
Early	Sheltering, then Evacuation	1 – 25 rem ^a 5 rem to child thyroid ^e	Shelter-in-place and take protective actions ^b until additional instructions are provided. Administration of prophylactic drugs—potassium iodide ^{c,e} , Administration of other prophylactic or decorporation agents ^d Emergency response personnel should place forth priority on assisting (e.g., evacuate) this population.
Inter-mediate	Relocation of public	2 – 5 rem ^f	Phased relocation of the public. Prioritize population projected to receive higher doses.

^a Total Effective Dose Equivalent (TEDE)—the sum of the effective dose equivalent from external radiation exposure and the committed effective dose equivalent from inhaled radioactive material. This is the projected dose over the Early Phase. For an IND incident 1 rem ≈ 1 rad.

^b Seek shelter in well protected areas (e.g., basements, central areas of single story buildings, central areas on upper floors of multi-story buildings) of sturdy and stable structures. Remove or clean clothing that has become dusty. Clean skin and hair of dusty material. Use soap and water if available. Minimize the breathing of dust. Drink bottled water. Administer first-aid, as appropriate.

^c Provides thyroid protection from radioactive iodine only.

^d For other information on other radiological prophylactics and medical countermeasures, refer to <http://www.fda.gov/cder/drug/prepare/default.htm>, <http://www.bt.cdc.gov/radiation>, or <http://www.orau.gov/reacts>.

^e Committed Dose Equivalent (CDE). FDA understands that a KI administration program that sets different projected thyroid radioactive dose thresholds for treatment of different population groups may be logistically impractical to implement during a radiological emergency. If emergency planners reach this conclusion, FDA recommends that KI be administered to both children and adults at the lowest intervention threshold (i.e., >5 rem (0.05 Sv) projected internal thyroid dose in children) (FDA 2001).

^f Total Effective Dose Equivalent (TEDE)—the sum of the effective dose equivalent from external radiation exposure and the committed effective dose equivalent from inhaled radioactive material. This is the projected dose over the first year.

Appendix A: Review of Existing Public Protection Recommendations for Nuclear Incidents

Excerpts from the current Federal guidance concerning nuclear incidents are provided below to provide a background for this paper.

A.1 ***Manual of Protective Action Guides and Protective Actions for Nuclear Incidents (PAG Manual) (EPA, 1992)***

The *Foreword* section of the PAG manual states that the guidance “may be used for responding to any type of nuclear incident or radiological emergency, except nuclear war.” Although Chapter 1 of the PAG Manual states that nuclear incidents include accidental and deliberate events, the PAG Manual does not consider IND events because the possibility of a terrorist obtaining and deploying an IND was likely not considered a credible event at the time the PAG Manual was developed.

A.2 ***Application of Protective Action Guides for Radiological Dispersal Device (RDD) and Improvised Nuclear Device (IND) Incidents, (Federal Register’, June 1, 2004)***

This document states that Federal agencies support the use of existing early and intermediate phase PAGs, as found in the EPA PAG Manual, for acts of radiological and nuclear terrorism.

A.3 ***Preparedness Directorate; Protective Action Guides for Radiological Dispersal Device (RDD) and Improvised Nuclear Device (IND) Incidents, (Federal Register, Vol. 71, No. 1, Tuesday, January 3, 2006)***

- “Prior to September 11, radiological emergencies were considered bounded by potential nuclear power plant accidents. However, new terrorist scenarios have emerged that offer new and different response challenges.” (page 174)
- “However, the EPA Manual, often called the PAG Manual, was not developed to address response actions following radiological or nuclear terrorist incidents. Also, the PAG Manual does not address long-term cleanup.” (page 174)
- “As a result of September 11, the Federal Government has reevaluated the PAGs for their applicability to RDD and IND incidents.” (page 176)
- “In deriving the recommendations contained in this guidance, new types of incidents and scenarios that could lead to environmental radiological contamination were considered. **The working group determined that the existing PAGs for the early and intermediate phases, including worker protection guides, published in the EPA PAG Manual, are also appropriate for use in RDD and IND incidents.**” (page 176)

A.4 ***The Planning Guidance for Protection and Recovery Following Radiological Dispersal Device (RDD) and Improvised Nuclear Device (IND) Incidents, (i.e., DHS Planning Guidance), (Federal Register, Vol. 73, No. 149, Friday, August 1, 2008)***

- “This document provides guidance for site cleanup and recovery following an RDD or IND incident, and affirms the applicability of existing 1992 EPA PAGs for radiological emergencies.” (page 45030)
- “In addition to the issuance of this Guidance, in response to interagency working group discussions and public comments, further guidance will be provided for the consequences that would be unique to an IND attack. This Guidance was not written to provide specific recommendations for a nuclear detonation (IND), but to consider the applicability of existing PAGs to RDDs and INDs. In particular, it does not consider very high doses or dose rate zones expected following a nuclear weapon detonation and other complicating impacts that can significantly affect life-saving outcomes, such as severely damaged infrastructure, loss of

communications, water pressure, and electricity, and the prevalence of secondary hazards. Scientifically sound recommendations for responders are a critical component of post-incident lifesaving activities, including implementing protective orders, evacuation implementation, safe responder entry and operations, and urban search and rescue and victim extraction. In the interim, this Guidance should be used until the IND guidance is developed.” (page 45030)

- “Table 1 provides a summary of the early and intermediate phase PAGs for protection of the general public in an RDD or IND incident and key protective actions.” (pages 45034 and 45035)

TABLE 1—PROTECTIVE ACTION GUIDES FOR RDD AND IND INCIDENTS		
Phase	Protective action recommendation	Protective action guide
Early	Sheltering-in-place or evacuation of the public ^a .	1 to 5 <i>rem</i> (0.01–0.05 <i>Sv</i>) projected dose. ^b
	Administration of prophylactic drugs—potassium iodide ^{c,e} . Administration of other prophylactic or decorporation agents ^d .	5 <i>rem</i> (0.05 <i>Sv</i>) projected dose to child thyroid. ^{c,e}
Intermediate	Relocation of the public	2 <i>rem</i> (0.02 <i>Sv</i>) projected dose first year. Subsequent years, 0.5 <i>rem/y</i> (0.005 <i>Sv/y</i>) projected dose. ^b
	Food interdiction	0.5 <i>rem</i> (0.005 <i>Sv</i>) projected dose, or 5 <i>rem</i> (0.05 <i>Sv</i>) to any individual organ or tissue in the first year, whichever is limiting.
	Drinking water interdiction	0.5 <i>rem</i> (0.005 <i>Sv</i>) projected dose in the first year.

^a Should normally begin at 1 *rem* (0.01 *Sv*); take whichever action (or combination of actions) that results in the lowest exposure for the majority of the population. Sheltering may begin at lower levels if advantageous.

^b Total Effective Dose Equivalent (TEDE)—the sum of the effective dose equivalent from external radiation exposure and the committed effective dose equivalent from inhaled radioactive material.

^c Provides thyroid protection from radioactive iodine only.

^d For other information on other radiological prophylactics and medical countermeasures, refer to <http://www.fda.gov/cder/drugprepare/default.htm>, <http://www.bt.cdc.gov/radiation>, or <http://www.orau.gov/reacts>.

^e Committed Dose Equivalent (CDE). FDA understands that a KI administration program that sets different projected thyroid radioactive dose thresholds for treatment of different population groups may be logistically impractical to implement during a radiological emergency. If emergency planners reach this conclusion, FDA recommends that KI be administered to both children and adults at the lowest intervention threshold (*i.e.*, >5 *rem* (0.05 *Sv*) projected internal thyroid dose in children) (FDA 2001).

A.5 Planning Guidance for Response to a Nuclear Detonation (DHS, January 16, 2009)

- “Since the events of September 11, 2001, the nation has taken a series of historic steps to address threats against our safety and security. This guidance represents an additional step in this continuing effort to increase the nation’s preparedness for potential attacks against our nation. It was developed in response to gaps noted in the previously published Department of Homeland Security (DHS) “Planning Guidance for Protection and Recovery Following Radiological Dispersal Device (RDD) and Improvised Nuclear Device (IND) Incidents” (Federal Register, Vol. 73, No. 149, Friday, August 1, 2008; 2 http://www.fema.gov/good_guidance/download/10260) and hereafter referred to as DHS Planning Guidance (DHS 2008). While the publication provides substantial guidance to Federal, State, and local planners for responding to such incidents, it concedes that it does not sufficiently prepare local and State emergency response authorities for managing the catastrophic consequences of a nuclear detonation as follows:

➤ “In addition to the issuance of this Guidance, in response to interagency working group discussions and public comments, further guidance will be provided for the consequences that would be unique to an IND attack. This Guidance was not written to provide specific recommendations for a nuclear detonation (IND), but to consider the applicability of existing PAGs³ to RDDs and INDs. In particular, it does not consider very high doses or dose rate zones expected following a nuclear weapon detonation and other complicating impacts that can significantly affect life-saving outcomes, such as severely damaged infrastructure, loss of communications, water pressure, and electricity, and the prevalence of secondary hazards. Scientifically sound recommendations for responders are a

critical component of post-incident lifesaving activities, including implementing protective orders, evacuation implementation, safe responder entry and operations, and urban search and rescue and victim extraction.” (page 8)

- “This guidance does not replace the DHS Planning Guidance (DHS 2008); however, it does provide specific guidance for response in the damaged region surrounding a nuclear detonation (i.e., within approximately three miles of a 10 kiloton (KT) device) and the life threatening fallout region (i.e., where fallout is deposited within 10 – 20 miles of the detonation site).” (page 9)
- “The area covered by fallout that impacts responder life-saving operations and/or has acute radiation injury potential to the population is known as the dangerous fallout (DF) zone. To the three zones already described (LD, MD, and NG), a fourth is added, the dangerous fallout (DF) zone. While fallout may trigger consideration of PAGs hundreds of miles away (DHS 2008), this DF zone pertains to near-in areas to focus on activities that maximize population survival and limit acute radiation injuries. Figure 1.4 illustrates the relation of the DF zone to zones LD, MD and NG.” (pages 24-25)

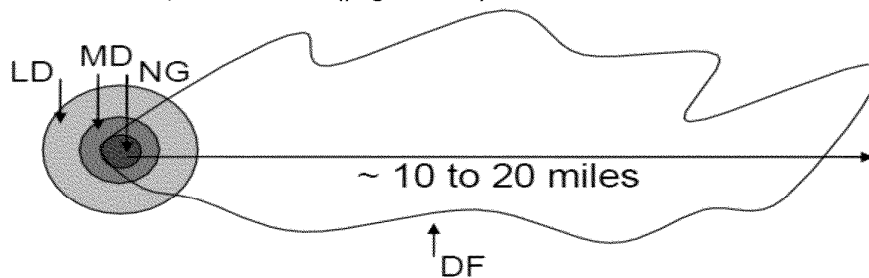


Figure 1.4: Representative dangerous fallout (DF) zone in which an early and direct threat from fallout radioactivity exists. A radiation exposure rate of 10 R/hour is used to delimit this zone.

- “Table 1.4: Approximate acute death and acute symptoms estimates as a function of whole-body absorbed doses (for adults), for use in decision making after short-term^a radiation exposure adapted from NCRP, AFRRI, Goans, IAEA, ICRP and Mettler (NCRP 2005; DOD, 2003; Goans and Wasalenko, 2005; IAEA, 1998; ICRP, 1991; Mettler and Upton, 1995).” (page 27)x

Short-Term Whole-Body Dose [rad (Gy)]	Acute Death ^b from Radiation Without Medical Treatment (%)	Acute Death from Radiation with Medical Treatment (%)	Acute Symptoms (nausea and vomiting within 4 h) (%)
1 (0.01)	0	0	0
10 (0.1)	0	0	0
50 (0.5)	0	0	0
100 (1)	<5	0	5 – 30
150 (1.5)	<5	<5	40
200 (2)	5	<5	60
300 (3)	30 – 50	15 – 30	75
600 (6)	95 – 100	50	100
1,000 (10)	100	>90	100

^aShort-term refers to the radiation exposure during the initial response to the incident. The acute effects listed are likely to be reduced by about one-half if radiation exposure occurs over weeks.

^bAcute deaths are likely to occur from 30 to 180 d after exposure and few if any after that time. Estimates are for healthy adults. Individuals with other injuries, and children, will be at greater risk.

- “The most important mission in the DF zone is communicating protective action orders to the

public. Generally, the order would be to seek and remain in a robust shelter until advised otherwise to avoid exposure to fallout. This communication is a temporary action until the affected population can be evacuated in a safe and orderly fashion. Preparedness planning and effective communication plans, messages, and means of delivery will be the key to survival for many in the DF zone.” (page 39)

- “One of the greatest threats to the life and health of people in the vicinity of a nuclear explosion is exposure to radioactive fallout. People may be exposed to dangerous levels of fallout in the moderate damage (MD) and light damage (LD) zones, and further out to 10 or 20 miles in the dangerous fallout (DF) zone. There are two principle actions that may be taken to protect the public from fallout: taking shelter and evacuation. These protective actions may be self-executed by informed members of the public, or they may be communicated and orchestrated by response officials during the incident. Timely decisions about shelter and evacuation are critical to saving lives and reducing radiation injuries. The effective implementation of protective actions during an incident is largely dependent on prevent preparedness and dissemination of guidance to the public. This section provides an overview of sheltering and evacuation and describes the protective actions and planning considerations for the decision-maker.” (pages 47 -48)
- “The standard ways to reduce radiation exposure are as follows: reduce time in the zone, increase distance from the source of radiation (the fallout), and/or use of dense materials (like concrete, brick, or earth) as shielding against the radiation. In the case of widespread fallout, the primary protective actions are to take shelter and to evacuate. Evacuation reduces time spent exposed to radiation; the goal, of course, is to avoid exposure. Sheltering protects people by (a) providing shielding, and (b) increasing distance from fallout, especially in the center of a large building. To take "shelter" as used in this document means going in, or staying in, any enclosed structure to escape direct exposure to fallout. "Shelter" may include the use of pre-designated facilities or locations. It also includes locations readily available at the time of need, including staying inside where you are, or going immediately indoors in any readily available structure. "Adequate" shelter is shelter that protects against acute radiation effects, and significantly reduces radiation dose to occupants during an extended period.” (page 48)
- “The Environmental Protection Agency (EPA) publishes protective actions guides (PAGs)¹⁶ for nuclear incidents. The Department of Homeland Security “Planning Guidance for Protection and Recovery Following Radiological Dispersal Device (RDD) and Improvised Nuclear Device (IND) Incidents” (DHS 2008) affirms the applicability of existing EPA guidance for radiological dispersal device (RDD) and improvised nuclear device (IND) incidents in areas beyond those subject to the elevated radiation dose rates and other impacts associated with a nuclear explosion. The radiation protection principles, however, are the same regardless of the potential dose or circumstances. The difference in the case of a nuclear explosion is that priority must be given to the radiation protection principle that acute-level radiation exposures should be prevented. Existing PAGs could be applied in areas outside the DF zone, which could be below the radiation level of acute health effects. They should also be applied during the intermediate phase of the incident, when relocation would be considered as a protective action.” (Page 49)
- “As a general estimate, 5 rem, the annual limit for a radiation worker but not necessarily the limit to be used for an event such as this, would increase the lifetime risk of cancer by <0.5%. The average lifetime risk is around 25% so this dose would add <0.5% to that risk. For 25 rem the increased risk is approximately 2%, and for 100 rem, approximately 6-8%.” (Page 65)

**** RECOMMENDATION ******EMERGENCY WORKER GUIDELINES IN THE EARLY PHASE**

EMERGENCY WORKER GUIDELINES IN THE EARLY PHASE (Full Version)		
Total effective dose □ equivalent (TEDE)^a guideline	Activity	Condition
5 rem (0.05 Sv, ~5 cGy)	All occupational exposures	All reasonably achievable actions have been taken to minimize dose.
10 rem (0.1 Sv, ~10 cGy)	Protecting valuable property necessary for public welfare (e.g., a power plant).	<ul style="list-style-type: none"> • All appropriate actions and controls have been implemented; however, exceeding 5 rem (0.05 Sv, 5 cGy) is unavoidable. • Responders have been fully informed of the risks of exposures they may experience. • Dose >5 rem (0.05 Sv, 5 cGy) is on a voluntary basis. • Appropriate respiratory protection and other personal protection is provided and used. • Monitoring available to project or measure dose.
25 rem (0.25 Sv, ~25 cGy) ^b	Lifesaving or protection of large populations. Worker doses higher than 25 rem (0.25 Sv, 25 cGy) are conceivable in a catastrophic incident such as an IND incident.	<ul style="list-style-type: none"> • All appropriate actions and controls have been implemented; however, exceeding 5 rem (0.05 Sv) is unavoidable. □ • Responders have been fully informed of the risks of exposures they may experience. □ • Dose >5 rem (0.05 Sv, 5 cGy) is on a voluntarily basis. • Appropriate respiratory protection and other personal protection is provided and used. □ • Monitoring available to project or measure dose.
50 rem (0.5 Sv, ~50 cGy)	Lifesaving or protection of large populations.	Individual cumulative absorbed dose that triggers consideration of withdrawing an emergency responder from within the relevant perimeter (area).
^a The projected sum of the effective dose equivalent from external radiation exposure and committed effective dose equivalent from internal radiation exposure.		
^b EPA's 1992 PAG Manual states that "Situations may also rarely occur in which a dose in excess of 25 rem for emergency exposure would be unavoidable in order to carry out a lifesaving operation or avoid extensive exposure of large populations." Similarly, the NCRP and ICRP raise the possibility that emergency responders might receive an equivalent dose that approaches or exceeds 50 rem (0.5 Sv) to a large portion of the body in a short time (Limitation of Exposure to Ionizing Radiation, National Council on Radiation Protection and Measures, NCRP Report 116 (1993a). If lifesaving emergency responder doses approach or exceed 50 rem (0.5 Sv, 50 cGy) emergency responders must be made fully aware of both the acute and the chronic (cancer) risks of such exposure.		
REFERENCE: Department of Homeland Security / Federal Emergency Management Agency <i>Planning Guidance for Protection and Recovery Following Radiological Dispersal Device (RDD) and Improvised Nuclear Device (IND) Incidents</i> (August 1, 2008)		